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TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	10/809,535	
	Filing Date	Mar 24, 2004	
	First Named Inventor	Kelley, Francis J.	
	Art Unit		
	Examiner Name		
Total Number of Pages in This Submission	4	Attorney Docket Number	02009US

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): Preliminary Amendment
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Kenneth A. Benson, Reg. No. 27,971
Signature	<i>Kenneth A. Benson</i>
Date	April 30, 2004

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MAY 04 2004

Applicant(s):
Kelley et al.

Application No.: 10/809535

Filed: 3/24/2004

Title: COMPOSITIONS AND METHODS FOR
POLISHING COPPER

Attorney Docket No.: 02009US

Art Unit:

Examiner:

OFFICIAL

PRELIMINARY AMENDMENTCommissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Please amend this application as follows:

In the Specification:

In paragraph [0010] please change "0.2 to 5.0 weight percent of water soluble cellulose" to "0.01 to 5.0 weight percent of water soluble cellulose". This change will make the range consistent with the range as stated in the STATEMENT OF THE INVENTION in paragraphs [0006] and [0007] where it is "0.01 to 5 modified cellulose" by weight percent.

REMARKS

The above change in the specification in no way introduces new matter. The change corrects an obvious mistake in the DETAILED DESCRIPTION.

Attached to this Preliminary Amendment is a corrected page 3 of the specification.

Respectfully submitted,

April 30, 2004
Date

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alloys thereof.

[0010] The polishing composition of this invention contains 0.01 to 5.0 weight percent of water soluble cellulose modified with carboxylic acid functionality. Preferably, the composition contains about 0.3 weight percent of water soluble cellulose. Exemplary modified cellulose are anionic gums such as agar gum, arabic gum, ghatti gum, karaya gum, guar gum, pectin, locust bean gum, tragacanth gums, tamarind gum, carrageenan gum, and xanthan gum, modified starch, alginic acid, mannuronic acid, guluronic acid, and their modifications and combinations. The preferred water soluble cellulose, carboxy methyl cellulose (CMC), has a degree of substitution of 0.1 to 3.0 with a molecular weight of 20K to 1000K. More preferred CMC has a degree of substitution of 0.7 to 1.2 with a molecular weight of 40K to 250K. Degree of substitution in CMC is the number of hydroxyl groups on each anhydroglucose unit in the cellulose molecule that is substituted. It can be considered as a measure of the "density" of carboxylic acid groups in the CMC.

[0011] Advantageously, the solution contains up to 25 weight percent oxidizer. More preferably, the oxidizer is in the range of 5 to 10 weight percent. The oxidizer is particularly effective at assisting the solution in removing copper at low pH ranges. The oxidizing agent can be at least one of a number of oxidizing compounds, such as hydrogen peroxide (H_2O_2), monopersulfates, iodates, magnesium perphthalate, peracetic acid and other per-acids, persulfates, bromates, periodates, nitrates, iron salts, cerium salts, Mn (III), Mn (IV) and Mn (VI) salts, silver salts, copper salts, chromium salts, cobalt salts, halogens, hypochlorites and a mixture thereof. Furthermore, it is often advantageous to use a mixture of oxidizer compounds. When the polishing slurry contains an unstable oxidizing agent such as, hydrogen peroxide, it is often most advantageous to mix the oxidizer into the composition at the point of use.

[0012] Further, the solution contains 0.05 to 1.0 weight percent inhibitor to control copper interconnect removal rate by static etch or other removal mechanism. Adjusting the concentration of an inhibitor adjusts the interconnect metal removal rate by protecting the metal from static etch. Advantageously, the solution contains 0.2 to 1.0 weight percent inhibitor. The inhibitor may consist of a mixture of inhibitors. Azole inhibitors are particularly effective for copper and silver interconnects. Typical azole inhibitors include benzotriazole (BTA), mercaptobenzothiazole (MBT), tolyltriazole and imidazole. BTA is a particularly effective inhibitor for copper and silver.